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Calculating Variabilities for Postmaster Costs*

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A. Introduction and Background

In Docket No. RM2020-2, the Postal Service proposed updating and improving the attribution of Postmaster costs. The Postal Service proposed replacing a variability that was over thirty years old and was based upon a simple regression on ten data points:[1]

> The Docket No. R84-1 variability, currently in use, was based upon a regression using just ten data points. The Docket No. R84-1 model relied upon so few data points because of the lack of available data on the WSCs for individual post offices. However, this has since changed. As in other functions, the Postal Service now routinely collects data on Postmaster workload for operational purposes. The primary users of these data are area, district, and other field personnel who are interested in validating current workloads and the corresponding pay structure at post offices. But the existence of this operational data provides an excellent opportunity for updating and improving the Postmaster variability.
>
> The advantage of using this operational data for a variability analysis is that they contain both the EAS grade and current WSCs for the Postmasters in the EAS system, covering over 13,000 offices. Such data will support a more sophisticated variability analysis than was possible in the past.

The existence of a large operational data set permitted a more sophisticated analysis of the nature of Postmaster compensation, and the specification and estimation of econometric models that reflect the actual structure of that system:[2]

> In addition, the operational data will support estimation of variability models that reflect the true structure of Postmaster costs. Figure 1 presents a plot of each office's EAS grade minimum salary against its WSCs for all of the offices in EAS

[1] *See*, Petition of The United States Postal Service for the Initiation of a Proceeding to Consider Proposed Changes in Analytical Principles (Proposal Ten), Docket No. RM2020-2, Nov. 29, 2019 at 3.

[2] *Id.*

grades 18 through 22. It demonstrates the “step function” nature of the EAS structure. Note that there are only five different values for the minimum salary, despite many different values for WSCs. Given this structure, the appropriate econometric approach is to estimate a discrete dependent variable model. Discrete dependent variable models are designed to provide appropriate estimation techniques when the dependent variable takes on a limited number of individual values. Specifically, to match the structure of the EAS compensation system, a series of logistical or “logit” models were estimated.

The Postal Service also identified and corrected a computational error in the Docket No. R84-1 variability formula.[3] After considering Proposal Ten, the Commission rejected it. The Commission cited four reasons for its rejection. The Commission argued that there were issues with the percentage change in WSCs that was used to calculate the variabilities, that there was a failure to demonstrate the robustness of the variability calculation based upon that percentage change, that clear criteria were not used in the sensitivity analysis that supported the choice of the percentage change, and that the computational method for the variability did not rely upon both increases and decreases in Work Service Credits (WSCs).[4]

To its credit, the Commission did not simply reject the proposed variability method, but offered two alternative methods that would remedy the deficiencies in Proposal Ten:[5]

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[3] *See*, Investigating the Variability of Postmaster Costs, Docket No. RM2020-2, Nov. 29, 2019 at 3.

[4] *See*, Order No. 5932, Order on Analytical Principles Used in Periodic Reporting (Proposal Ten), Docket No. RM2020-2, July 8, 2021, at 45.

[5] *Id.* at 47.

> The Public Representative states that he is unable to present an alternative or alterations to Proposal Ten that would permit Commission acceptance because an appropriate model would need to be developed that could "identify distinct and nonoverlapping activities which drive workload or worktime." PR Comments at VII-1. The Commission disagrees and asserts that there are two possible approaches to modifying Proposal Ten that would improve the existing methodology for attributing Postmaster costs.

The Commission also recognized the progress the Postal Service made in Proposal Ten and supported an effort by the Postal Service to further improve and resubmit an updated Postmaster variability analysis:[6]

> The Commission appreciates the Postal Service's effort in updating Postmaster attributable costs. It encourages the Postal Service to consider the Commission's assessment, implement suggested improvements, and resubmit its request.

The Commission reiterated this view in a subsequent docket in which it was discussing priorities for future analytical work.[7] In reviewing recent developments in costing methodologies, the Commission discussed Docket No. RM2020-2:

> *Docket No. RM2020-2*. In this proceeding, the Commission denied a Postal Service request to implement a new model to calculate Postmaster cost variability.[8] The Commission made suggestions as to how this proposal could be improved and possibly accepted in the future.

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[6] *Id.*

[7] See, Docket No. RM2022-1, Priorities for Future Data Collection and Analytical Work Relating to Periodic Reporting at 7, October 8, 2021, (Order No. 6004).

[8] *See*, Docket No. RM2020-2, Order on Analytical Principles Used in Periodic Reporting (Proposal Ten), July 8, 2021 (Order No. 5932).

The Postal Service appreciates the Commission's efforts and guidance on improving the Postmaster variability analysis, and accepts the Commission's recommendation to rectify the deficiencies in Proposal Ten and submit a refined analysis. In doing so, the Postal Service will closely follow the explicit proposals the Commission put forth to resolve its concerns, without modifying those parts of Proposal Ten that were not of concern. For example, the Commission did not express any concerns about the operational database or the Postal Service's method of identifying a small number of out-of-bounds observations. In fact, the Commission made use of both the operational data set and the identification algorithm in its own analysis of the Postmaster econometric models.[9] It also reviewed and accepted the econometric models presented in Proposal Ten that underlie the variability calculation:[10]

> Despite these potential drawbacks, the Commission finds the logistic regression and the probability cutoff point of 0.5 (the probability-threshold) used to perform the first classification of post offices in Proposal Ten to be consistent with standard practice in the classification literature. Hosmer describes the classification method used in Proposal Ten and also mentions the popularity of the use of the 0.5 cutoff point. (Footnote Omitted)

It also stated that:[11]

> The Commission therefore concludes that under the correct-specification assumption and assuming that the actual outcomes were unknown, Proposal Ten's classifier minimizes the probability of misclassification in a large sample, regardless of the distribution of WSCs. The Commission finds it acceptable for Proposal Ten to use the

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[9] *See*, Order No. 5932, Order on Analytical Principles Used in Periodic Reporting (Proposal Ten), Docket No. RM2020-2, July 8, 2021, at 19.

[10] *Id. at 25.*

[11] *Id. at 27.*

> logistic regression to classify the post offices and to set the cutoff point for the estimated probabilities, *i.e.,* to set the probability-threshold to 0.5.

In sum, the Commission made clear that its rejection of Proposal Ten was focused on the method of variability calculation. In this docket, the Postal Service's proposal will directly address and improve that part of the Postmaster analysis following the Commission's guidance.

B. The Commission's Two Approaches to Calculating a Postmaster Variability

Calculating the variability for Postmaster costs is more complicated than for other cost segments because the underlying cost generating process is discontinuous. A post office can gain or lose WSCs over quite a range without causing a change in the office's classification, and thus its minimum salary. Only when the post office has a WSC change that pushes it into the Zone of Tolerance, does the WSC change cause a potential classification and cost change. In that case, the cost "jumps" as the post office changes its Executive and Administrative Salary (EAS) level.[12] A post office's cost is associated with either one EAS grade or another, and any cost changes are made in steps, causing the underlying cost surface to be discontinuous. This discontinuity means that the distribution of post office WSCs that existed before the change in WSCs occurred will affect the number of offices that switch classifications, and will thus affect the resulting cost response and variability.

[12] For a discussion of the nature of the Postmaster compensation structure and the role of the Zone of Tolerance, *see*, Investigating the Variability of Postmaster Costs, Docket No. RM2020-2, Nov. 29, 2019 at 1-2.

The first of the two variability calculation approaches proposed by the Commission is termed the “Large Sample Version of Proposal Ten Variability” (LSVPTV) method.[13] This approach addresses the discontinuity issue through analyzing the variability calculation under the assumption that there is an infinite number of post offices in the two grades. This approach turns the discontinuous structure of the actual Postmaster data into a continuous probability distribution.

To simplify the calculation of that probability distribution, the approach makes use of the relationship between WSC levels and the probability that an office will be in the higher grade. That probability function is defined by the estimated logit model, and given the shape of a logit function, each WSC level around the area of the Zone of Tolerance will be associated with a unique probability level. Consequently, the variability formula can be written in terms of the levels of WSC, instead of the levels of probability. Also, there is a given WSC level that corresponds to the cutoff level of probability (0.50) for changing EAS grades. For example, using the Proposal Ten logit model for post offices in EAS grades 20 and 21, a WSC value of 13,059 corresponds to the 0.50 cutoff. Post offices with WSCs above 13,059 are classified as EAS-21 offices by the model. This transformation, by itself, does not resolve the discontinuity issue, as calculating the variability still requires selecting a value for the size of the change in WSCs.

The LSVPTV method moves to a continuous probability distribution by applying the law of large numbers. That is, the LSVPTV approach asks what the variability

[13] *See,* File A5: Suggested Approaches to Address the Shortcomings of Proposal Ten, Library Reference (Suggested Approaches), PRC-LR-RM2020-2/5, Docket No. RM2020-2, July 9, 2021 at 1.

formula would look like if, instead of having the actual number of offices in each category, there were an infinite number of offices in the two categories. The assumption of an infinite number of observations in each group transforms the two discrete groups of post offices into areas within a continuous probability distribution.

But even with a continuous distribution, there still remains the issue of choosing the percentage change in WSCs that will be applied to calculate the variability. The LSVPTV approach proposes resolving this issue by calculating the limit of the variability function as the change in WSCs goes to zero. Taking the limit permits re-writing the variability function in terms of the probability distribution for WSCs (which is continuous) instead of the change in the number of offices in each EAS grade (which is discontinuous). However, the WSC probability distribution is unknown and must be estimated. There are a variety of methods available to estimate the distribution, but there is not an agreed upon standard approach. Moreover, these estimation methods require potentially controversial assumptions about key characteristics of the distribution, such as the kernel and the bandwidth.

The second variability computational algorithm proposed by the Commission is termed the Minimization of Error Distance Between Predicted and Actual Cost (MEDBPAC) method.[14] It is also referred to as a "geometrical" approach. It starts with the recognition that the total cost for all Postmasters across all grades can be computed by the sum of two products. The first product is the result of multiplying the minimum salary for the lower EAS grade by the number of offices in that grade and the second

[14] *Id.* at 12.

product is the result of multiplying the minimum salary for the higher EAS grade by the number of offices in that grade.

The next step in the algorithm is to specify the conditional expectation of the total cost. The MEDBPAC approach makes use of the estimated logit models, which are asserted to provide the best prediction of the total cost:[15]

> The conditional expectation on WSC is the best prediction function given WSC, in the sense that it minimizes the prediction error among all possible prediction functions of WSC, where the error is measured as the Euclidean distance between the target and the prediction.

To calculate a variability, the algorithm modifies the total Postmaster cost equation by replacing the counts of the numbers of offices in the higher and lower EAS grades with the sums of the probabilities of an office being in either the higher or lower EAS grade, as determined by the logit model. This leads to the derivation of the equation for which the variability will be calculated. In that equation, the expected value of total cost (TC), conditioned on the levels of Work Service Credits (WSC_i) is a function of the salary for the lower grade (S_L), the salary of the upper grade (S_H) and the estimated probability that an office will be in the higher grade ($\hat{p}[WSC_i]$):[16]

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[15] *Id.* at 14.

[16] There appears to be a mathematical or typographical error in the derivation of the MEDBPAC variability equation. Equation 36 on page 17 of the Suggested Approaches documents reads as:

$$\hat{E}\left(TC \middle| WSC_1, \dots WSC_{1_N}\right) = S_H\left[\sum_{i=1}^{N}\left(P(Y_i = 1 \middle| WSC_1, \dots WSC_{1_N}\right)\right] + S_L\left[\sum_{i=1}^{N}\left(P(Y_i = 1 \middle| WSC_1, \dots WSC_{1_N}\right)\right].$$

This expression simplifies to the sum of the higher EAS grade and lower EAS grade salaries times the probability of an office being in the upper grade. This is the

$$\hat{E}\left(TC\middle|WSC_1,\ldots WSC_{1_N}\right) = \sum_{i=1}^{N}\left(S_L + \hat{p}[WSC_i](S_H - S_L)\right)$$

The resulting variability formula is given by:

$$\varepsilon_{C,WSC} = \sum_{i=1}^{N} \frac{1}{\sum_{i=1}^{N}\left(S_L + \hat{p}[WSC_i](S_H - S_L)\right)} \left(\hat{p}[WSC_i](S_H - S_L)(1 - \hat{p}[WSC_i])\hat{\beta}WSC_i\right).$$

C. Choosing a Method of Variability Calculation

The Commission presented two methods of variability calculation for improving Proposal Ten, but did not explicitly endorse either one. However, it made clear that both methods should be seriously considered:[17]

> In the next section, the Commission offers some ideas to help address the shortcomings that it has identified in Proposal Ten. While these are not intended to be prescriptive, future proposals to estimate Postmaster variability should explain why each of the suggested alternatives were or were not utilized.

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probabilistic analog of multiplying the sum of the higher and lower salaries times the number of offices in the higher grade, which does not equal the total cost for the two grades. A corrected version of equation 36 is provided below:

$$\hat{E}\left(TC\middle|WSC_1,\ldots WSC_{1_N}\right) = S_H\left[\sum_{i=1}^{N}\left(P(Y_i = 1\middle|WSC_1,\ldots WSC_{1_N}\right)\right] + S_L\left[\sum_{i=1}^{N}\left(P(Y_i = 0\middle|WSC_1,\ldots WSC_{1_N}\right)\right].$$

This is the probabilistic analog of the total cost equation provided previously in the derivation.

[17] *See*, Order No. 5932, Order on Analytical Principles Used in Periodic Reporting (Proposal Ten), Docket No. RM2020-2, July 8, 2021, at 47.

The Postal Service carefully considered and evaluated the two proposed methods to determine which one would provide a strong foundation for calculating Postmaster attributable costs. In that evaluation, two primary criteria were applied:

1. Does the method require any additional assumptions or estimations and how open ended are they?

2. How well does the method comport with the underlying economic theory of calculating attributable costs?

A careful evaluation of the two methods leads to a determination that the MEDBPAC approach is preferred. It has some relative advantages, and there are some relative disadvantages to the LSVPTV approach.

First, the LSVPTV method involves calculating the limit of the variability function (if it exists), not calculating the variability directly from the variability function itself. The LSVPTV approach also requires assuming that there is an infinite number of post offices, which may not be too troublesome of an assumption for the EAS-18 to EAS-18B variability, where there 8,648 post offices, but is a real issue for other variability calculations where there are far fewer post offices in the two EAS grades. In addition, the LSVPTV method requires non-parametric estimation of the continuous probability distribution of the WSCs for each pair of post offices. As the Commission pointed out, there are a variety of methods available for this estimation, but all of them require some judgement, and thus impart some arbitrariness to the estimation.[18] The need to make such decisions raises a potentially controversial issue in calculating the variabilities. It

[18] *See,* File A5: Suggested Approaches to Address the Shortcomings of Proposal Ten, Library Reference (Suggested Approaches), PRC-LR-RM2020-2/5, Docket No. RM2020-2, July 9, 2021 at 10.

also adds another step of complexity, and effort, in computing the variabilities. Finally, the calculated LSVPTV variability turns out to be the variability of cost with respect to the threshold WSC level, not WSCs directly, which may raise issues for the calculation of incremental costs.

One relative advantage of the MEDBPAC approach is that it is much closer in form to established methods of variability calculation. It is also transparent, and it does not require another layer of assumptions and estimations. That is, it can be calculated directly from the existing logit models without any additional estimation. The MEDBPAC method also makes use of the actual distribution of WSCs across post offices in calculating the variability, ensuring that the variabilities reflect the underlying cost surface. Finally, it is consistent with the economic theory underlying attributable cost calculation. In fact, the MEDBAC formula can be derived using traditional variability methods.

That derivation starts with recognition that for each pair of EAS grades, the estimated logit model provides the probability of that office being in the higher grade. Given that an office must be in one of the two grades, the model also indirectly provides the probability that an office is in the lower grade, as the probability of an office being in the lower grade is just one minus the office's probability of being in the higher grade. Consequently, the predicted salary cost for an individual post office ($\hat{C}_i$) is its probability of being in the higher EAS grade ($\hat{p}[WSC_i]$) times the higher-grade salary (S_H) plus the probability of it being in the lower EAS grade ($1 - \hat{p}[WSC_i]$) times the lower grade salary (S_L):

$$\hat{C}_i = \hat{p}[WSC_i]S_H + (1 - \hat{p}[WSC_i])S_L$$

Substitution for the lower grade probability allows the post office's predicted cost to be expressed as the value of the lower-grade salary plus the salary differential $(S_H - S_L)$ times the probability of being in the higher EAS grade:

$$\hat{C}_i = S_L + (S_H - S_L)\hat{p}[WSC_i].$$

In the standard approach to finding variabilities, the variability calculation typically starts with the calculation of marginal cost with respect to the cost driver. For an individual post office, the marginal postmaster cost is given by the derivative of the predicted cost:

$$\frac{\partial \hat{C}_i}{\partial WSC_i} = (S_H - S_L)\frac{\partial \hat{p}[WSC_i]}{\partial WSC_i}.$$

To find the marginal cost, one has to take the derivative of the logit model:

$$\frac{\partial \hat{C}_i}{\partial WSC_i} = (S_H - S_L)\left[\frac{\hat{\beta} e^{\hat{\alpha}+\hat{\beta} WSC_i}\left(1 + e^{\hat{\alpha}+\hat{\beta} WSC_i}\right) - \hat{\beta}\left(e^{\hat{\alpha}+\hat{\beta} WSC_i}\right)^2}{\left(1 + e^{\hat{\alpha}+\hat{\beta} WSC_i}\right)^2}\right].$$

Fortunately, this can be simplified to:

$$\frac{\partial \hat{C}_i}{\partial WSC_i} = (S_H - S_L)\hat{\beta}\hat{p}[WSC_i](1 - \hat{p}[WSC_i])$$

An individual office's variability is found by multiplying its marginal cost by its WSC and dividing by its predicted cost:

$$\varepsilon_{\hat{C}_i, WSC_i} = \frac{(S_H - S_L)\hat{\beta}\hat{p}[WSC_i](1 - \hat{p}[WSC_i])WSC_i}{\hat{p}[WSC_i]S_H + (1 - \hat{p}[WSC_i])S_L}.$$

To find the overall variability for a pair of EAS grades, one starts with the fact that the predicted total cost for the pair ($\hat{C}$) is just the sum of the predicted costs for the included post offices:

$$\hat{C} = \sum_{i=1}^{N} \hat{C}_i$$

The overall marginal cost is the sum of the marginal costs for the included offices. Note that we must be careful to delineate between an overall change in WSC (∂WSC) and the office-specific changes (∂WSC_i):

$$\frac{\partial \hat{C}}{\partial WSC} = \sum_{i=1}^{N} \frac{\partial \hat{C}_i}{\partial WSC_i} \frac{\partial WSC_i}{\partial WSC}$$

The overall variability is the overall marginal cost times overall WSC, divided by total cost for the pair of EAS grades:

$$\varepsilon_{\hat{C},WSC} = \left(\sum_{i=1}^{N} \frac{\partial \hat{C}_i}{\partial WSC_i} \frac{\partial WSC_i}{\partial WSC} \right) \frac{WSC}{\sum_{i=1}^{N} \hat{C}_i}.$$

This simplifies to:

$$\varepsilon_{\hat{C},WSC} = \sum_{i=1}^{N} \varepsilon_{\hat{C}_i,WSC_i} \, \varepsilon_{WSC_i,WSC} \, \frac{\hat{C}_i}{\sum_{i=1}^{N} \hat{C}_i}$$

In the established approach to calculating variabilities, the change in the cost driver for any subunit is proportional to the overall change: $\varepsilon_{WSC_i,WSC}$ = 1. Applying this condition simplifies the expression for overall variability:

$$\varepsilon_{\hat{C},WSC} = \sum_{i=1}^{N} \varepsilon_{\hat{C}_i,WSC_i} \frac{\hat{C}_i}{\sum_{i=1}^{N} \hat{C}_i}.$$

With a few steps of algebra, this can be shown to be identical to the variability formula from the MEDBPAC approach, listed above. This mathematical equivalence demonstrates that the MEDBPAC approach can be viewed as the application of the established variability methodology to each office in an EAS pair, and then finding the overall variability by multiplying each of those variabilities by the associated office's relative cost.

In sum, the MEDBPAC approach is more transparent, requires no additional estimations, is straight-forward to calculate, and is consistent with the economic theory underlying the calculation of attributable costs. Therefore, it is the preferred of the two methods.

D. Estimating the Logit Models On 2022 Data

The logit models used in Docket No. RM2020-2 were estimated on Form 150 WSC data from 2019. Given that three years have passed since those data were collected, it seems appropriate to extract the same type of data for 2022 from the Postal Service's electronic Form 150 data system and to estimate the logit models on more recent data. Not only does this update the variability analysis to the most recent data available, but also it allows checking the stability of the logit models.

The February 2022 data were extracted and the resulting data set includes 13,592 post offices. This is very similar to the 2019 dataset which included 13,611 post offices, a difference of only 19 post offices. Table 1 presents the numbers of post offices in the various EAS grades for both 2019 and 2022. As with the total number of post offices, there is also stability in the number of offices by EAS grade. For most grades, there is very little change in the number of offices in the grade across the two years. There is a modest decrease in the number of EAS-18 offices, which is partially offset by a modest increase in the number of EAS-18B offices. There are 12 more EAS-24 offices, which is not a large absolute increase, but it is a nearly 5 percent increase because there are relatively few offices in that grade.

Table 1: Numbers of Post Office by Grade in 2019 and 2022

EAS Grade	**2019**	**2022**	**Change**	**% Change**
EAS-18	4,113	3,998	-115	-2.8%
EAS-18B	4,535	4,612	77	1.7%
EAS-20	2,614	2,619	5	0.2%
EAS-21	1,170	1,177	7	0.6%
EAS-22	858	854	-4	-0.5%
EAS-24	257	269	12	4.7%
EAS-26	64	63	-1	-1.6%
Total	13,611	13,592	-19	-0.1%

Source: Compare 2022 and 2019 Datasets.sas

In terms of estimating the models, the important comparison is what, if anything, happened to the size of the datasets used to estimate the equations. Table 2 presents the sizes of the six estimation datasets for 2019 and 2022. Four of the six data sets are within one percent of one another, over the two different years. The EAS-18B to EAS-20 dataset is slightly larger in 2022, but the difference is not material. The EAS-24 to EAS-26 dataset is larger in 2022 by 11 observations. This is a 3.4 percent increase and keeps the dataset in the same order of magnitude.

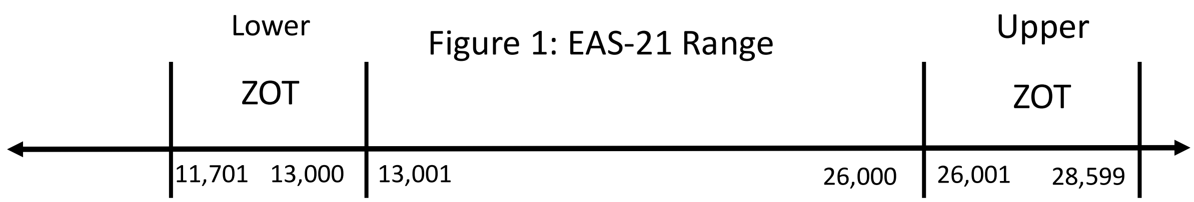
Table 2: Changes in the Sizes of the Estimating Datasets From 2019 to 2022

Grade Pair	**2019**	**2022**	**% Change**
18-18B	8,648	8,610	-0.4%
18B-20	7,149	7,231	1.1%
20-21	3,784	3,796	0.3%
21-22	2,028	2,031	0.1%
22-24	1,115	1,123	0.7%
24-26	321	332	3.4%

Source: Compare 2022 and 2019 Datasets.sas

Estimation of the logit models in Docket No. RM2020-2 again produced the result that the estimated parameters, and thus variabilities, depend upon the spread of WSC values for post offices across the two EAS grades. EAS grade pairs that tend to have post offices clustered towards the ends of their grade's WSC ranges around the Zone of Tolerance are likely to have larger response parameters and variabilities. This result occurs because the response of a post office to a change in WSCs depends upon where it is within its EAS grade's WSC boundaries If an office is in the middle of its current EAS grade WSC range, it is less likely to change grade after a given change in WSCs. For example, consider the range of WSCs for EAS-21 offices, as shown in

Figure 1. If an office has, say 20,000 WSCs, a change of 2,000 WSCs will not move it to another grade. In contrast, if an office has 26,000 WSCs, then a gain of 2,000 WSCs would move it well into the upper Zone of Tolerance for that grade.



Source: Investigating the Variability of Postmaster Costs, Docket No. RM2020-2, Nov. 29, 2019 at 46.

To investigate whether the dispersions of offices' WSC values, within the EAS grades, changed from 2019 to 2022, the coefficients of determination for WSCs for each EAS grade were calculated for each of the years. The results are presented in Table 3.

Table 3: Coefficients of Variation of WSCs By EAS Grade For 2019 and 2022

EAS Grade	2019	2022	Change
EAS-18	0.435	0.430	-0.005
EAS-18B	0.278	0.283	0.006
EAS-20	0.266	0.265	-0.002
EAS-21	0.207	0.205	-0.003
EAS-22	0.286	0.275	-0.011
EAS-24	0.264	0.264	0
EAS-26	0.255	0.248	-0.007

Source: Compare 2022 and 2019 Datasets.sas

A comparison of results across the years shows very little change, suggesting that dispersion has not changed over the last three years. The comparisons suggest that the 2022 dataset is similar to the 2019 dataset, and is likely to support successful estimation of the six logit models.

The 2022 logit models are estimated with the same algorithm that was used by the Postal Service, and the Commission, in Docket No. RM2020-2. An important step in that algorithm is identifying and eliminating offices whose WSCs are strongly inconsistent with their EAS grade. For example, as Figure 1 shows, the lower bound on EAS-21 is 13,001 WSCs. The lower limit on the Zone of Tolerance is 11,701 WSCs. Thus, any office in the EAS-21 grade should have at least 11,701 WSCs. But, in the 2022 dataset, there is an EAS-21 office with a listed value of just 493 WSCs. This is clearly an out-of-bounds value for WSCs for an EAS-21 office, and including it in the estimation dataset could distort the estimated parameters.

To identify out-of-bounds offices in Docket No. RM2020-2, the Postal Service established boundaries that lie outside the Zone of Tolerance limits for each EAS grade. For example, the lower limit for the lower Zone of Tolerance for EAS-21 offices is 11,701 WSCs, but the cutoff for finding out-of-bounds offices lies below that, at 10,000 WSCs. Similarly, the upper limit for the upper Zone of Tolerance for EAS-21 offices is 28,599 WSCs and the upper cutoff for out-of-bounds EAS-21 offices is 30,000 WSCs. The Docket No. RM2020-2 boundaries are again applied here. Table 4 presents the boundary limits for the various Zones of Tolerance across the EAS grades, along with the cutoff value for identifying any out-of-bounds offices. It also presents the number of out-of-bounds offices identified for each model.

Like in Docket No. RM2020-2, the number of identified offices is very small with only 22 of 13,592 office being so identified. In addition, the identified offices are not concentrated in a specific EAS grade, so the number of observations eliminated for each model is a tiny fraction of the observations used to estimate the model.

Table 4: Identifying Out-of-Bounds Offices

Model	Type of ZOT	ZOT Limit	Cutoff	# Identified
18 to 18B	18 Upper	2,291	2,400	6
	18B Lower	1,869	1,700	7
18B to 20	18B Upper	6,049	7,000	0
	20 Lower	4,951	4,500	5
20 to 21	20 Upper	14,299	18,000	0
	21 Lower	11,701	10,000	2
21 to 22	21 Upper	28,599	30,000	0
	22 Lower	23,401	20,000	1
22 to 24	22 Upper	75,020	80,000	0
	24 Lower	61,381	50,000	1

Source: Identify Out of Bounds Obs.sas

Table 5 presents important descriptive statistics for the estimated logit models. First, it presents the number of observations for each model, reflecting the fact that there are more post offices in the lower EAS grades than in the upper EAS grades. Next, it presents the Cox-Snell R^2 statistics for the six logit models, and they indicate that all of the models fit their respective datasets well. Finally, the Hosmer-Lemeshow statistics are presented. These statistics test the null hypothesis of a good fitting model.[19] In all cases, the calculated Hosmer-Lemeshow Chi-squared test statistics are very small relative to the sizes of the datasets and the associated probability values reveal that the null hypothesis cannot be rejected for any of the models. In other words, there is no evidence suggesting that any of the models are not good-fitting.

Table 5: Descriptive Statistics for the Logit Models

EAS Pair	**Regression Obs.**	**Cox Snell R2 Statistic**	**Hosmer – Lemeshow Statistic**	**P Value**
18-18B	8,597	0.9659	0.4484	0.9783
18B-20	7,226	0.9613	1.4513	0.9186
20-21	3,794	0.9657	1.8335	0.6077
21-22	2,030	0.9691	0.0716	0.9994
22-24	1,122	0.9779	1.3987	0.4969
24-26	332	0.9763	0.1512	0.6974

Source: Logit Model Results.xlsx

Table 6 presents the estimated coefficients from the logit models along with the tests of their significance. Those statistics indicate that all of the estimated coefficients are statistically significant. As with the Docket No. RM2020-2 results, all of the estimated intercept parameters are negative, indicating that at very low levels of WSCs, the probability of a post office being in the upper EAS grade is essentially zero.

The estimated WSC coefficients in the logit models measure how quickly a post office will transition from one EAS grade to another in response to changes in WSCs.

[19] For a discussion of the Hosmer-Lemeshow statistic and a presentation of its formula, please *see*, Investigating the Variability of Postmaster Costs, Docket No. RM2020-2, Nov. 29, 2019 at 25.

The larger the estimated coefficient, the greater the response in the probability of moving to the other EAS grade given a change in WSCs. The larger response implies a faster transition between grades.

Review of Table 6 shows that the estimated WSC coefficients decline as one moves from the lower-level EAS grades to higher-level EAS grades. This decline reflects the fact that the width of the WSC band, per grade, widens as the EAS grade increases. For example, the width of the WSC band for the EAS-20 grade is 7,499 WSCs, while the width of the WSC band for the EAS-22 grade is 42,199 WSCs. When the band is wider, a given-sized increase in WSC is less likely to lead to a change in EAS grade, and that fact is captured by the smaller estimated WSC coefficients.

Table 6: Logit Estimation Results After Removing Out-of-Bounds Observations

Model	Parameter	Estimate	Std. Error	Wald Chi-Square
18 to 18B	Intercept	-36.025	1.776	411.29
	WSC	0.0176	0.0009	411.473
18B to 20	Intercept	-35.721	1.855	370.687
	WSC	0.0065	0.0003	369.654
20 to 21	Intercept	-47.771	3.935	147.417
	WSC	0.0036	0.0003	146.212
21 to 22	Intercept	-48.633	5.169	88.514
	WSC	0.0019	0.0002	88.319
22 to 24	Intercept	-68.966	13.423	26.397
	WSC	0.0010	0.0002	26.507
24 to 26	Intercept	-71.251	26.719	7.111
	WSC	0.0004	0.0002	6.964

Source: Logit Model Results.xlsx

E. Calculating the Variabilities

A first step in estimating the 2022 variabilities is to confirm that the simplified variability algorithm derived above produces the same results as the MEDBPAC algorithm proposed by the Commission. This can be done by applying the algorithm to calculate the FY 2019 variabilities using the same Docket No. RM2020-2 data and logit models used by the Commission. Table 7 presents the comparison of the two computational algorithms. For four of the six pairs of EAS grades the estimated variabilities are identical, but there are slight differences for the two EAS pairs including the EAS-18B grade. Unfortunately, Commission Library Reference PRC-LR-RM2020-2/5 does not contain any documentation about, or present the programs for, the calculation of the MEDBPAC variabilities. The variabilities appear solely as an entry in a table, so it is not possible to trace what might be the source of the minor discrepancy. It could be, for example, that the Commission variabilities were estimated in the STATA program and the Postal Service variabilities were estimated in the SAS program. Given that the two variabilities including the EAS-18B grade also have the largest number of observations, it is possible that different software programs could produce slightly different results. Nevertheless, the results are sufficiently close to be confident that the Postal Service's application of the MEDBPAC approach is producing the same variabilities as the Commission's original application.

Table 7: Postmaster Variabilities Based upon 2019 Data

Regression	**PRC Docket No. RM2020-1**	**USPS Docket No. RM2022-X**
EAS-18 to EAS-18B	4.83%	4.80%
EAS-18B to EAS-20	5.33%	5.35%
EAS-20 to EAS-21	4.77%	4.77%
EAS-21 to EAS-22	2.05%	2.05%
EAS-22 to EAS-24	5.38%	5.38%
EAS-24 to EAS-26	8.04%	8.04%

Source: Variabilities Based on 2019 Data.xlsx

One other issue needs to be addressed before the Postmaster variabilities based on 2022 data are estimated. The 2022 Postmaster variabilities depend not only on the logit models estimated on the 2022 WSC data, but also the EAS salary schedule for 2022. For EAS grades 20 through 26, the minimum salary is determined directly by the EAS salary schedule. However, for EAS grades 18 and 18B, a subset of post offices is entitled to a higher minimum salary, set at a value of $73,517:[20]

> A new position group, *Customer Services* will be established and added to Employee and Labor Relations Manual 412.12b and be effective November 20, 2021. The *Customer Services* position group will include Postmasters Grade 18 and Grade 18B among the group and minimum salaries of those Postmasters will be at a rate of 5% greater than that of a City Carrier at RSC Q, Step 0. The SDA minimum for this position group will be $73,517.

The term SDA, applied above, stands for Supervisory Differential Adjustment, and eligibility for SDA is similar to the criterion that must be met under the Fair Labor Standards Act for FLSA-Exempt Status. The requirement is that the Postmaster must directly supervise two or more full-time equivalent bargaining unit employees. The Postal Service's operational Postmaster data system identifies which offices are exempt and non-exempt, so it is possible to calculate the average minimum EAS-18 and EAS-18B salaries for 2022. There are 3,992 EAS-18 post offices and 47.2 percent of them are exempt, and thus eligible for the higher minimum salary. A much higher

[20] Section 7 of Postal Service's Decision (for changes in pay policies and schedules and fringe benefits for Postmasters through May 20, 2023), provided as attachment to letter dated August 23, 2021, from Katherine S. Attridge Vice President, Labor Relations to Mr. Daniel M. Heins, President United Postmasters and Managers of America.

percentage, 95.8, of the 4,605 EAS-18B post offices are exempt. Multiplying the exempt and non-exempt minimum salaries by their respective percentages of post offices produces an average minimum salary of $65,936 for EAS-18 offices and $73,137 for EAS-18B offices.

As discussed above, the modification in the SDA resulted in a significant increase in the minimum salaries for Grade 18 and 18B exempt Postmasters. This modification also caused an adjustment to the minimum salary for Grade EAS-20 Postmasters, to ensure they received a salary minimum that was higher than the EAS-18B exempt Postmasters' salary. Table 8 presents the minimum salaries for each EAS grade for both 2019 and 2022.

Table 8: Minimum Salaries by Grade and Year

Grade	**2019**	**2022**	**Change**
EAS-18	$54,081	$65,936	21.9%
EAS -18B	$59,300	$73,137	23.3%
EAS-20	$65,300	$76,170	16.6%
EAS-21	$71,000	$76,910	8.3%
EAS-22	$73,300	$79,680	8.7%
EAS-24	$82,000	$89,060	8.6%
EAS-26	$99,900	$107,670	7.8%

Sources: Investigating the Variability of Postmaster Costs, Docket No. RM2020-2, Nov. 29, 2019 at 10, EAS Salary Schedule 2022, and Calculate 18 and 18B Salary.sas.

For the higher EAS grades, the minimum salaries increased in the 8 to 9 percent range over three years from 2019 to 2022. But the minimum salaries on the lower end of the EAS scale increased more sharply. The EAS-18 and EAS-18B grades experienced relatively large increases in minimum salary over the period, in the range of 22 to 23 percent, while the EAS-20 salary increased by 16.6 percent.

The percentage increases in minimum salary for grades EAS-18 and EAS-18B were similar in size, with the EAS-18B percentage increase being slightly larger. That difference, along with the fact that the 2019 minimum salary for the EAS-18B grade was higher than the 2019 minimum salary for the EAS-18 grade, caused a larger absolute increase (in dollar terms) for the EAS-18B grade salary than for the EAS-18 grade salary. As a result, the size of the minimum salary gap between the two grades increased from $5,219 to $7,201. A Postmaster shifting between EAS-18 to EAS-18B in 2022 would have a larger impact on Postal Service costs than a Postmaster making the same move in 2019. This would put upward pressure on the EAS-18 and EAS-18B variability.

The percentage gain in the EAS-18B minimum salary over the 2019 to 2022 period was greater than the percentage gain for the EAS-20 minimum salary, and the EAS-18 minimum salary dollar gain was about $3,000 larger than the EAS-20 minimum salary gain. Thus, the gap between the EAS-18B and EAS-20 minimums salaries fell from $6,000 to $3,033. Finally, the relatively large gain in the EAS-20 minimum salary reduced the gap between the EAS-20 and EAS-21 minimum salaries from $5,700 to $740. These two reduced salary gaps will put downward pressure on the respective variabilities as the cost consequences of changing EAS grades were reduced.

Table 9 presents the variabilities calculated on the 2022 WSC and 2022 EAS minimum salary data, as well as the 2019 variabilities for comparison.

Table 9: Calculated Variabilities Using 2019 and 2022 Data

EAS Grade Pairs	2019	2022	Change
18-18B	4.80%	5.47%	0.67%
18B-20	5.35%	2.19%	-3.16%
20-21	4.77%	0.57%	-4.20%
21-22	2.05%	2.24%	0.19%
22-24	5.38%	5.09%	-0.28%
24-26	8.04%	7.83%	-0.21%

Source: Compare 2019 and 2022 Variabilities.xlsx

Three of the estimated variabilities were very stable, as their values in 2022 were very close to their values in 2019. The 2022 variabilities for EAS-21, EAS-22, and EAS 24 are all about a quarter of a percentage point (in absolute value) from their respective 2019 values. But the variability for EAS-18 shows a modest change, and the EAS-18B and EAS-20 variabilities show substantial change. The EAS-18 variability increased by two-thirds of a percentage point, while the EAS-18B variability fell by just over three percentage points, and the 2022 EAS-20 variability decreased by 4.2 percentage points.

Theoretically, these changes could come either from changes in the logit model parameters or from changes in the EAS salary steps, or both. However, the relatively large changes in the salaries for the lower EAS grades appear to be the most likely reason for the change. As explained above, the gap between the EAS-18 and EAS-18B minimum salaries increased from $5,219 to $7,201. The larger gap implies that there is a larger cost effect in 2022 of a change between the two grades. Even with the same rate of change in the number of offices, in response to WSC changes, the cost variability would be larger due to the larger salary gap.

In the same vein, but in the opposite direction, the gap between EAS-18B minimum salary and EAS-20 minimum salary was nearly cut in half. The much smaller salary difference between the two grades means that there is less cost response from an office changing between the two grades. This would cause the variability to be substantially smaller. The same effect occurred for the EAS-20 and EAS-21 minimum salaries. The percentage growth in the EAS-20 minimum salary was about twice as large as the percentage growth in the EAS-21 minimum salary. Consequently, the salary gap fell to just $740. Such a small salary difference between the two grades means that there is very little cost response from an office changing between the two grades. This would cause the variability to be much smaller.

To confirm that the salary change is the source of the change in the EAS-18B and EAS-20 variabilities, one can calculate the variabilities using the parameters from the logit models estimated on the more recent 2022 WSC data, while continuing to use the 2019 EAS minimum salary schedule. This approach isolates the effects of any parameter changes, as the salary schedule does not change.

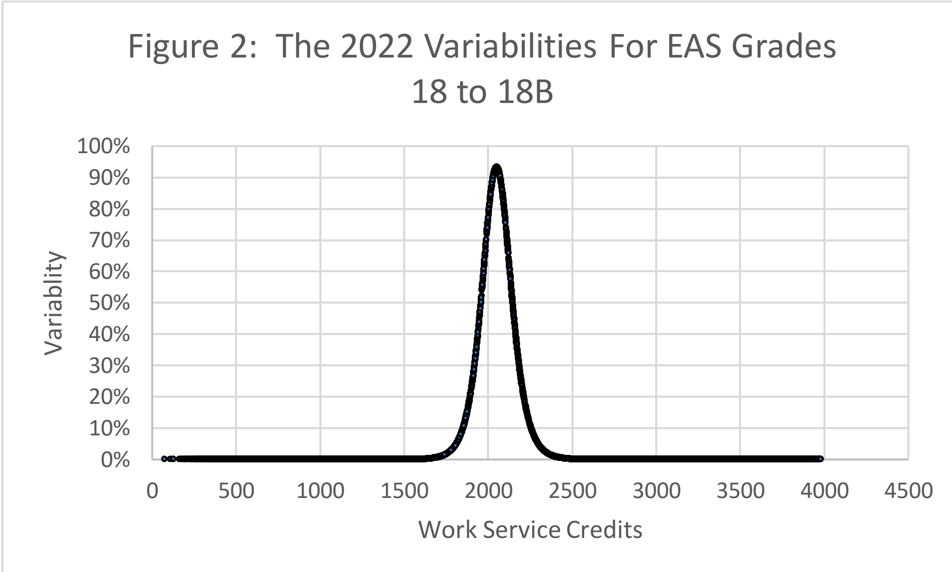
Table 10 presents the results of this hybrid analysis. Comparing the variabilities based upon both the 2019 logit models and the 2019 EAS salary schedule with those based upon the 2022 logit models and the 2019 EAS salary schedule shows the variabilities for all EAS grades to be very close to one another, including grades EAS-18B and EAS-20. This means that the difference between the 2022 variabilities and the 2019 variabilities for these two grades is coming from the change in the 2022 salary schedule, and the 2022 variabilities are thus accurately reflecting the changes in costs that would be incurred in 2022 due to EAS grade changes.

Table 10: Decomposing the Variability Change Between 2019 and 2022

EAS Grade Pair	2019 WSC 2019 EAS Schedule	2022 WSC 2019 EAS Schedule	2022 WSC 2022 EAS Schedule
18-18B	4.80%	4.87%	5.47%
18B-20	5.35%	5.23%	2.19%
20-21	4.77%	4.99%	0.57%
21-22	2.05%	2.02%	2.24%
22-24	5.38%	5.13%	5.09%
24-26	8.04%	8.16%	7.83%

Source: Decompose Variability Change.xlsx

The previous discussion highlights the role relative salaries play in influencing Postmaster variabilities, namely the bigger the gap in salary between two EAS grades, the larger the variability will be. A fuller understanding of the variabilities also requires review of the role that Work Service Credits play in determining them. That role can be illustrated by plotting the calculated variabilities for an EAS grade pair. For example, Figure 2 plots the variabilities against the WSCs for the 8,597 offices in the EAS-18 and EAS-18B pair. The first thing revealed by the figure is that most of the variabilities are either zero, or extremely close to zero. If one defines a zero variability as one with a value less than 0.00001, then 5,402 of the 8,597 variabilities, or 62.8 percent, have a zero value.

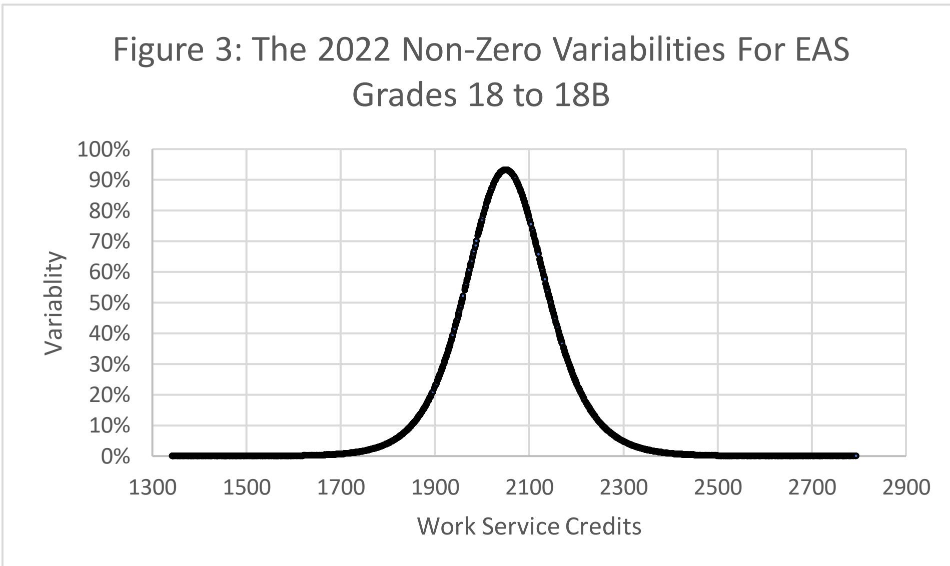


Source: Plot Var1818B_all.xlsx

The second thing revealed by Figure 2 is the fact that the non-zero variabilities are clustered in the middle of the WSC range, with the zero variabilities occurring as the WSC value moves toward the limits of the range. This is entirely consistent with the operational practice of how the EAS grade system works. Offices near the lower end of the WSC range have sufficiently low values of WSCs so that an increase will not move them to the higher EAS grade and the resulting variability is zero. Offices near the upper end of the range have sufficiently high values of WSCs so that a decrease will not move them to the lower EAS grade and the resulting variability is zero. Only in the middle of the WSC range, around the Zone of Tolerance, will changes in WSCs have a potential impact on the offices' EAS grade.

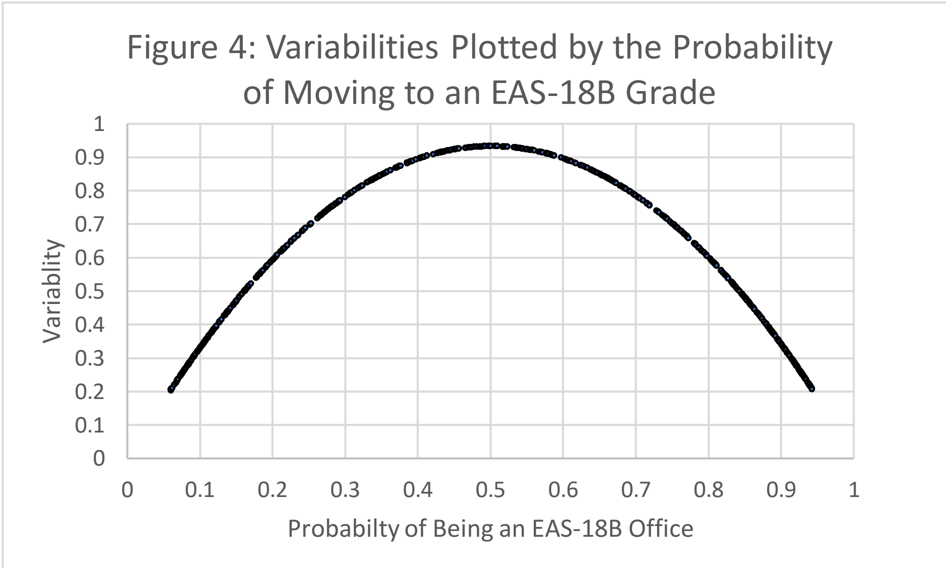
This is seen more clearly in Figure 3, which plots the non-zero variabilities for EAS grades 18 and 18B, where a zero variability is defined as a value less than 0.00001. The figure shows that the variability increases as a post office moves to the middle of the WSC distribution and then sharply rises as the office is within the Zone of

Tolerance. The variabilities then decline as an office's WSCs approaches the upper end of the Zone of Tolerance, and then diminishes toward zero as the WSCs for each office increases even more.



Source: Plot Var1818B_pos.xlsx

This pattern in the variabilities reflects the changes in the probability of switching offices. For a given EAS pair, the variability will be highest when the probability of switching a grade is highest. In the logit model, a probability of 0.50 is the cutoff between the lower and higher EAS grades. Offices closest to that value are the most likely to switch grades after a WSC change, and they have the highest variabilities. This is illustrated in Figure 4, which presents the calculated variabilities as a function of the probability of an office becoming an EAS-18B grade.



Source: Plot Var1818B_pos.xlsx

Calculating the variability for all offices allows the overall variability to reflect the actual distribution of WSCs and the resulting likelihoods of EAS grade switches. Unlike a flexible functional form, the logit model is well defined throughout the range of WSCs for each EAS grade pair, and thus supports calculating a separate variability for each office.

F. Investigating the Variability of Work Service Credits with Respect to Volume

In addition to providing two suggestions for improving the estimation of the variability of costs with respect to changes in Work Service Credits, the Commission also requested that the Postal Service investigate the variability of Work Service Credits with respect to volume.[21] As occurs in other cost components, Postmaster costs are

[21] *See*, Order No. 5932, Order on Analytical Principles Used in Periodic Reporting (Proposal Ten), Docket No. RM2020-2, July 8, 2021, at 14.

directly incurred in response to changes in a cost driver, Work Service Credits. There is an explicit structure relating WSCs to Postmaster salaries, and changes in WSCs have a direct impact on Postmaster costs. When a cost driver is used to capture the responsiveness of a component's cost, a second assumption, or analysis, is required to link movements in the cost driver to volume. In many parts of the established attributable costing methodology, such as mail processing or carrier delivery, the linkage of the cost driver to volume is based upon the assumption of proportionality. That is also the case for Postmasters, as the established methodology assumes that changes in WSCs are proportional to changes in volume.

To investigate the empirical validity of that assumption, one must investigate how Work Service Credits are determined for an individual office and attempt to ascertain what role volume plays in that determination. Work Service Credits are generated by the activities that a Postmaster undertakes to serve Postal Service customers. Investigation into how WSCs arise reveals a complex structure that accounts for the wide variety of activities that can take place at a post office. That complexity is illustrated below by a discussion of the various ways that Work Service Credits are generated.

One important source of Work Service Credits is the amount of revenue that flows through a post office. Revenue-based credits are generated through a system that translates a post office's revenue units into WSCs.[22] This system provides a declining rate of credit as the number of revenue units increases. For example, the first 25

[22] A revenue unit is the average amount of revenue per fiscal year from postage prices and fees for 1,000 pieces of originating mail and Special Service transactions.

revenue units translate one-for-one into WSCs, but the next 275 revenue units generate only one-half a credit per revenue unit. This structure can be expressed in tabular form:

REVENUE CREDIT STRUCTURE

Revenue Unit Range	Revenue Credit Formula
0-25	RU
26-300	25+0.5*(RU-25)
301-1,000	162.50+.25*(RU-300)
1,001-6,000	337.50+.10*(RU-1,000)
6001 & Up	837.50+.01*(RU-6,000)

Or, it can be expressed as an equation that relates a post office's revenue-generated Workload Service Credits (WSC_i) as a function of its revenue units (RU_i):

$$WSC_i = \sum_{i=1}^{25} RU_i + \sum_{i=26}^{300} 0.50 * RU_i + \sum_{i=301}^{1000} 0.25 * RU_i + \sum_{i=1001}^{6000} 0.10 * RU_i + \sum_{i=6001}^{\infty} 0.01 * RU_i$$

Another source of WSCs is through the credits a Postmaster gets for sorting mail for his or her own facility, and for other facilities. The amount of credit depends upon the stages of processing involved, and the revenue units for the offices for which the mail is sorted. For example, if the post office only sorts outgoing mail, the credit will be based upon the percentage of mail distributed at the home office (δ_i) and/or the percentage of the mail that is distributed for other offices (δ_j). The evaluated office receives a credit for 30 percent of the revenue units at the offices for which it does mail processing, including itself. More formally, for an outgoing-only sorting office, the mail-processing related workload service credits are given by:

$$WSC_i = 0.30 * \delta_i * \; RU_i + \sum_{j=1}^{N} 0.30 * \delta_j * RU_j,$$

where RU_i measures the revenue units for the office being evaluated and the RU_j measure the revenue units for other offices for which the evaluated office does sorting. For an office that does only incoming sorting the impact of revenue units on WSCs is reduced, and for an office that does both incoming and outgoing sorting, the impact of revenue units is increased. The additional WSCs are added to the WSCs directly based on revenue.

Post offices also receive network-based credits arising from the provision of delivery services through a variety of channels. These credits are network-based because they depend upon the number of points of delivery of different types that the post office serves. That is, the number of the credits is based upon the count of delivery points, not the volumes that go to those points. The credit is the same per delivery whether it is a high-volume delivery, a low-volume delivery, or even a zero-volume delivery. However, the number of credits depends upon the type of delivery point. For example, for a post office box, an office receives one WSC per box, but for a city carrier delivery point, the office receives 1.33 WSCs per delivery. Network-based credits are the simple sum of the number of points of delivery (POD_j), by type, multiplied by the respective credit (θ_j):

$$WSC_i = \sum_{i=j}^{m} \theta_j * POD_{ij.}$$

There is also a possible seasonal variation in network-based credits that reflects seasonal workload, if present. There are two hurdles that must be met before seasonal credit is earned by an office. First, the seasonal surge must last at least eight weeks, and second, the size of the seasonal increase must be at least 25 percent larger than normal. Otherwise, no seasonal credit is provided. The increase in seasonal workload is calculated by comparing the number of points of delivery served during the seasonal period with the number served during the rest of the year. Note that the required 25 percent increase must be across the sum of the points of delivery for the office.

When the seasonal criteria are met by a post office, it receives a seasonal credit based upon the seasonal increase in points of delivery ($SPOD_{ij}$) and the number of weeks the seasonal surge takes place (W_i):

$$WSC_i = \frac{\left(\sum_{j=1}^{m} SPOD_{ij} - POD_{ij}\right) * W_i}{52}.$$

A last set of Work Service Credits are for “exception” add on or subtraction credits. These arise when the post office is doing something out of the ordinary. This includes obtaining positive credits for having carrier or finance stations, being an air transfer office, being a lessor for a government owned building, or undertaking food stamp distribution. Postmasters will lose credits if more than 5 percent of the revenue base is for plant load volumes or if the office does not perform its own secondary distribution.

The above illustrations show that calculation of the Work Service Credits for a post office is complex, and incorporates a variety of different sources including revenue, delivery points, mail processing and seasonal factors. While equations can be developed (as demonstrated above) that relate the number of work credits to the various factors, the relationship of the various factors to volume is less clear. Some of the WSC sources, like revenue, appear to have a potential relationship with volume, while others, like the number of delivery points appear to not. Some credit sources, like the percentage of mail processed, potentially lie in between. Initial research into the potential relationship between volume and WSCs has shown it to be complex, with a variety of facets and not easily characterized. Additional future research is required to further understand and measure that relationship.

G. Impact of the New Variabilities

In the established version of the Postmaster cost model, a single variability is applied against the costs for EAS grades 18 through 22.[23] Grades EAS-24 and above receive a zero variability, by assumption. The new variability structure is different, with the costs for each of the EAS grades below EAS-26 receiving its own variability, including EAS-24. The Postmaster cost model has a single accrued cost for grade EAS-18, so the variabilities for EAS-18 and EAS-18B must be combined. The combined variability is the cost-weighted average of the EAS-18 and EAS-18B variabilities, with the costs being the relative calculated 2022 Form 150 costs for the two grades. Those relative cost proportions are multiplied by the respective variabilities to get the overall EAS-18 variability. (0.4387*0.0547 + 0.5613*0.0219 = 0.0363).

[23] *See*, CS01-Public-FY21.xlsx at Tab 1.01.

Table 11 presents the calculation of the FY 2021 volume variable costs for Postmasters, using the new 2022 variabilities. Total volume variable costs are $53.1 million, which translates to an overall variability of 3.03 percent. As explained in Docket No. RM2020-2, the new variability is lower than the existing variability for three reasons.[24] The first reason is that the existing variability suffers from a mathematical error; the formula used to calculate the variability is incorrect, leading to a computed variability that is larger than the actual variability that should be produced by the regression:[25]

> First, the Docket No. R84-1 variability was overstated due to a computational error. Correcting that error reduces the Docket No. R84-1 variability to 13 percent.

The next reason the current variability is lower than the 1984 variability is because it reflects the current composition of post office grades, which is different than the composition of post office grades that existed in the Docket No. R84-1 era. Specifically, lower grade offices have been eliminated due to POStPlan. In the lower grades, the sizes of the WSC bands are relatively small, meaning that the amount of the WSC change required to change grade is also relatively small. In higher EAS grades, the bands are much larger and larger increases in WSCs are thus required to change grade and salary. Eliminating the lower EAS grades means less likely changes in EAS

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[24] *See*, Investigating the Variability of Postmaster Costs, Docket No. RM2020-2, Nov. 29, 2019 at 46.

[25] *Id*.

grades and salaries for a given percentage change in WSCs, causing a lower variability:[26]

> Second, as explained above, POStPlan eliminated the lower EAS grades. In the lower grades, Postmasters could move relatively rapidly to a higher minimum salary by moving up an EAS grade. As a post office gets to the higher EAS grades, much larger increases in WSCs are required to move to a higher grade. Thus, increases in WSCs for Postmasters in the higher grades of the EAS system are less likely to cause them to move up to a higher minimum salary. This means that a given percentage increase in volume is less likely to create an increase in cost -- creating a lower variability.

The final reason the new variabilities are lower than the Docket No. R84-1 variability arises from the fact that the Docket No. R84-1 variability measured only the potential increase in cost from an increase in WSCs, not the actual increase. Because the Docket No. R84-1 variability was not based upon any actual post office data, it could not account for the actual distribution of WSCs across post offices. As a result, it tended to overstate the variability because it implicitly assumed that all offices would change grades when WSCs changed. The R84-1 approach thus did not measure how quickly the existing complement of Postmasters would actually change grades when WSCs change.

In contrast, the Commission's MEDBPAC approach averages the variabilities calculated at each post office included in the EAS grade pair used to estimate the logit models. It incorporates the distribution of WSCs across offices and reflects the actual,

[26] *Id.*

not potential, changes in cost associated with a given change in WSCs. Given that most post offices have WSC levels that imply that they are unlikely to change EAS grades in response to a WSC change, the actual variability should lie below the R84-1 potential variability:[27]

> Third, the Docket No. R84-1 approach measures only the potential increase in cost from increases in volume and thus WSCs, not the actual increase. That is, it measures how quickly salaries would rise from an overall increase in WSCs. But each EAS grade has a wide band of WSCs associated with it and most post offices have a level of WSCs such that typical increases will keep the Postmaster in the same grade.
>
> The Docket No. R84-1 methodology did not account for the amount of WSCs Postmasters are actually earning (captured by the distribution of offices, by WSCs within each grade), nor did it attempt to measure how quickly the existing complement of Postmasters would move up a grade if WSCs increased. The new study does those measurements and captures the impact of WSC increases that keep Postmasters in their same EAS grades as well as those that cause an increase in EAS grade.
>
> The Form 150 data show that the number and distribution of Postmasters across grades is quite stable, suggesting that the actual response in Postmasters to WSC changes is lower than the potential response measured in the Docket No. R84-1 methodology.

In sum, the Commission's MEDBPAC approach is an improvement over the Docket No. R84-1 approach because it does not contain a computational error, it

[27] *Id.* That most post offices are unlikely to change their EAS grade in response to a WSC change is highlighted by the fact, demonstrated above, that many, if not most, post offices have a zero variability under the MEDBPAC method.

depends upon, and reflects, the current structure of post offices staffed by Postmasters, and it captures the actual, not potential cost response to changes in WSCs.

Table 11: Calculating Volume Variable Costs Using 2022 Variabilities

ITEM	POSTMASTER SALARIES DISTRIBUTION KEY	ACCRUED COSTS DISTRIBUTED TO COMPONENTS	CAG L ACCRUED COSTS	TOTAL ACCRUED COSTS	VARIABILITY FACTOR	VOLUME VARIABLE COSTS	OTHER COSTS
UNITS	$	$(000)	$(000)	$(000)	%	$(000)	$(000)
EAS 18	627,213,039	1,034,328	21,315	1,055,644	3.63%	38,323	1,017,321
EAS 20	215,612,444	355,563		355,563	0.57%	2,021	353,542
EAS 21	99,626,661	164,293		164,293	2.24%	3,680	160,613
EAS 22	69,862,377	115,209		115,209	5.09%	5,867	109,342
EAS 24	24,861,457	40,999		40,999	7.83%	3,209	37,790
1.2 POSTMASTERS EAS-26 AND ABOVE	13,914,572	22,946		22,946	0.00%	-	22,946
TOTAL	1,051,090,550	1,733,339	21,315	1,754,654		53,100	1,701,554

Source: CS01-Public-FY21.New Variabilities.xlsx

A reduction in volume variable costs will translate into a reduction in the unit Postmaster costs, as illustrated in Table 12. That table shows the unit Postmaster costs, including piggyback costs, using both the new and the existing variabilities.[28] Because unit Postmaster costs are low to begin with, the reduction in variability does not have a large impact on those costs.

[28] The impact of the new variabilities on competitive products are presented in the non-public file, Non Public Impact.xlsx in USPS-RM2022-8/NP1.

Table 12
Impact of New Variabilities

Domestic Market Dominant Products	New Variabilities	Existing Variabilities	Difference
Single-Piece Letters	$0.0005	$0.0030	-$0.0025
Single-Piece Cards	$0.0003	$0.0020	-$0.0017
Presort Letters	$0.0004	$0.0022	-$0.0018
Presort Cards	$0.0003	$0.0015	-$0.0012
Single-Piece Flats	$0.0015	$0.0087	-$0.0072
Presort Flats	$0.0009	$0.0052	-$0.0043
Total First-Class Mail	$0.0004	$0.0025	-$0.0020
High Density and Saturation Letters	$0.0002	$0.0009	-$0.0008
High Density and Saturation Flats/Parcels	$0.0002	$0.0010	-$0.0008
Every Door Direct Mail-Retail	$0.0002	$0.0010	-$0.0009
Carrier Route	$0.0003	$0.0015	-$0.0012
Letters	$0.0002	$0.0012	-$0.0010
Flats	$0.0004	$0.0023	-$0.0019
Parcels	$0.0014	$0.0083	-$0.0068
Total USPS Marketing Mail	$0.0002	$0.0012	-$0.0010
In County	$0.0001	$0.0006	-$0.0005
Outside County	$0.0003	$0.0015	-$0.0012
Total Periodicals	$0.0002	$0.0014	-$0.0011
Bound Printed Matter Flats	$0.0007	$0.0042	-$0.0034
Bound Printed Matter Parcels	$0.0011	$0.0062	-$0.0051
Media/Library Mail	$0.0035	$0.0201	-$0.0166
Total Package Services	$0.0014	$0.0084	-$0.0069
Total Domestic Market Dominant Mail	$0.0003	$0.0018	-$0.0015
Total Domestic Competitive Mail and Services	$0.0041	$0.0239	-$0.0198
Total International Mail and Services	$0.0049	$0.0286	-$0.0236

Source: Public Impact.xlsx

For example, First Class Mail unit costs fall by $0.0020, two-tenths of a cent, and Marketing Mail unit costs fall by one-tenth of a cent. The impact for package products is slightly larger and total Package Services unit Postmaster costs fall by seven-tenths of a cent. Competitive unit costs fall by 1.98 cents.